



P2-112A

**A Pentium® II or Deschutes
Slot1 Processor based AGP
mainboard (100/66MHz)**

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These specifications are subject to change without notice.

*Manual Revision 3.2
SEP 30, 1998*

User Notice

The product name and revision number are both printed on the mainboard itself.

Handling Procedures

Static electricity can severely damage your equipment. Handle the P2-112A and any other device in your system with care and avoid unnecessary contact with system components on the mainboard.

Always work on an antistatic surface to avoid possible damage to the motherboard from static discharge.

We assume no responsibility for any damage to the P2-112A mainboard that results from failure to follow installation instructions or failure to observe safety precautions.

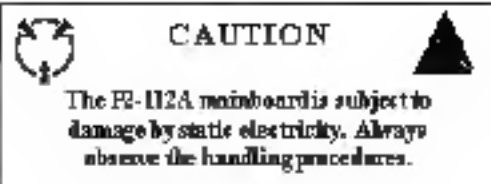


Table of Contents

Section 1	<i>Introduction</i>	
	Components Checklist	1-1
	<i>Overview</i>	
	Pentium II or Deschutes Processor	1-2
	S.E.C. Cartridge Terminology	1-3
	Accelerated Graphics Port	1-4
	Hardware Monitoring	1-4
	Desktop Management Interface	1-4
	P2-112A Form-Factor	1-6
	I/O Shield Connector	1-7
	Power-On/Off(Remote)	1-7
	System Block Diagram	1-8
Section 2	<i>Features</i>	
	P2-112A Features	2-1
Section 3	<i>Installation</i>	
	P2-112A Detailed Layout	3-2
	<i>Easy Installation Procedure</i>	
	Configure Jumpers	3-3
	System Memory Configuration	3-5
	Installing a Pentium® II Processor	3-9
	Device Connectors	3-10
Section 4	<i>Award BIOS Setup</i>	
	BIOS Instructions	4-1
	Standard CMOS Setup	4-2
	BIOS Features Setup	4-3
	Chipset Features Setup	4-8
	Power Management Setup	4-12

PNP/PCI Configuration	4-16
Load Setup Defaults	4-18
Integrated Peripherals	4-18
Change Supervisor or User Password	4-23
IDE HDD Auto Detection	4-24
HDD Low Level Format	4-26
Save & Exit Setup	4-26
Exit Without Saving	4-27

Section 5 *Appendix*

Appendix A

Memory Map	A-1
I/O Map	A-1
Timer & DMA Channels Map	A-2
Interrupt Map	A-2
RTC & CMOS RAM Map	A-3

Appendix B

POST Codes	A-5
Unexpected Errors	A-8

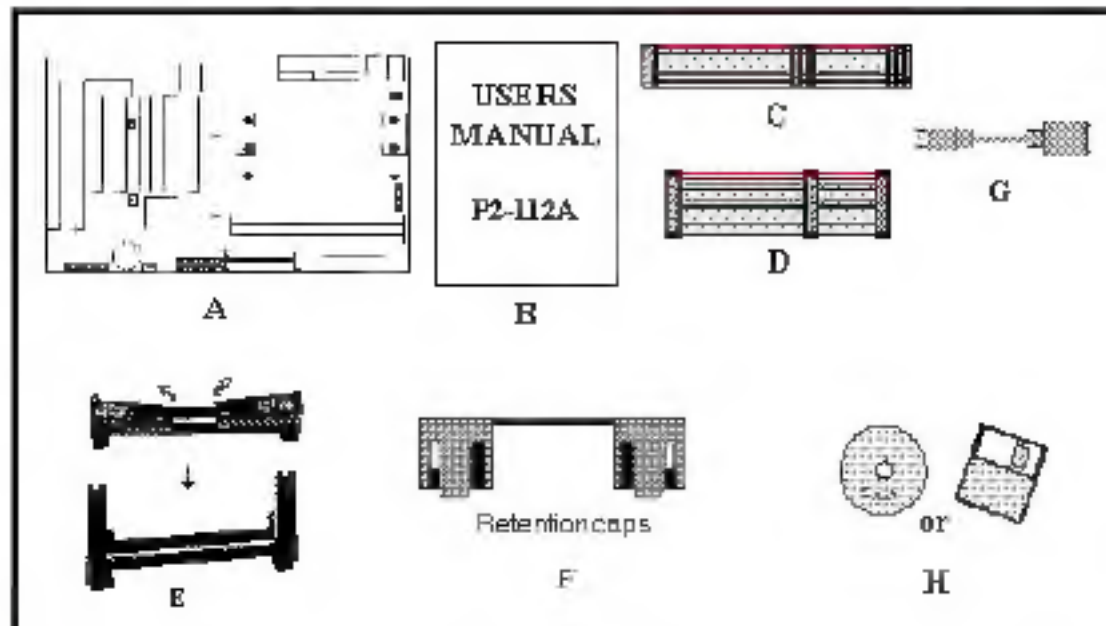
Appendix C

Load Setup Defaults	A-9
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Section 1 INTRODUCTION

Components Checklist

- ✓ A (1) P2-112A mainboard
- ✓ B (1) P2-112A user's manual
- ✓ C (1) Floppy ribbon cable
- ✓ D (1) Hard drive ribbon cables
- ✓ E (1) Foldable Retention Module
- ✓ F (1) Retention Caps for celeron Processor
- ✓ G (2) PS/2 to AT keyboard connector adapter (optional)
- ✓ H (1) Bus master drivers
(1) AGP Drivers



Overview

Pentium® II or Deschutes Processor

The Pentium® II or Deschutes Processor (The Deschutes Processor as 300/100MHz, 350/100MHz, 400/100MHz and 450/100MHz speed with 512K-L2 cache Versions.) is the follow-on to the Pentium® Processor. The Pentium® II or Deschutes Processor, like the Pentium® Pro processor, implements a Dynamic Execution micro-architecture -- a unique combination of multiple branch prediction, data flow analysis, and speculative execution. This enables the Pentium® II Processor to deliver higher performance than the Pentium® processor, while maintaining binary compatibility with all previous Intel architecture processors.

A significant feature of the Pentium® II or Deschutes Processor, from a system perspective, is the built-in direct multiprocessing support. In order to achieve multiprocessing, and maintain the memory and I/O bandwidth to support it, new system designs are needed. For systems with dual processors, it is important to consider the additional power burdens and signal integrity issues of supporting multiple loads on a high speed bus. The Pentium® II or Deschutes Processor card supports both uni-processor and dual processor implementations.

The Pentium® II or Deschutes Processor utilizes Single Edge Contact (S.E.C.) (Figure 1) cartridge packaging technology. The S.E.C. cartridge allows the L2 cache to remain tightly coupled to the processor, while maintaining flexibility when implementing high performance processors into OEM systems. The second level cache is performance optimized and tested at the cartridge level. The S.E.C. cartridge utilizes surface mounted core components and a printed circuit board with an edge finger connection. The S.E.C. cartridge package introduced on the Pentium® II Processor will also be used in future Slot 1 processors.

The S.E.C. cartridge has the following features: a thermal plate, a cover and a PCB with an edge finger connection. The thermal plate allows standardized heatsink attachment or customized thermal solutions. The thermal plate enables a reusable heatsink to minimize fit issues for serviceability, upgradeability and replacement. The full enclosure also protects the surface mount components. The edge finger connection maintains socketability for system configuration. The edge finger connector is denoted as "Slot 1 connector" in this and other documentation.

The entire enclosed product is called the Pentium® II or Deschutes Processor. The

packaging technology and each of the physical elements of the product are referred to using accurate technical descriptions. This allows clear reference to the products as just a processor. This is the model used in past packaging technologies like PGA, TCP, PQFP, DIP, etc.

S.E.C. Cartridge Terminology

- **Pentium® II or Deschutes Processor**
The new enclosed card packaging technology is called a "Single Edge Contact cartridge." This is similar to previous names for packaging technology such as PGA or TCP.
- **Processor card**
The green PCB (with or without components on it)
- **Processor core**
The silicon on the PLGA package on the PCB
- **Cover**
The plastic cover on the opposite side from the thermal plate.
- **Slot 1**
The slot that the S.E.C. cartridge plugs into, just as the Pentium® Pro processor uses Socket 8.
- **Retention mechanism**
Formerly "retention module" the dual posts, etc. that holds the cartridge in place.
- **Thermal plate**
The heatsink attachment plate.
- **Heat sink supports**
The support pieces that are mounted on the mainboard to provide added support for heatsinks.

The L2 cache (TagRAM, PBRAM) components keep standard industry names

The Pentium® II or Deschutes Processor is the first product to utilize the S.E.C. cartridge technology and Slot 1 connector. Unless otherwise noted, any references to "Pentium® II Processor," "Pentium® II or Deschutes Processor/Slot 1 processor" or "Deschutes Processor" will apply to both the Pentium® II

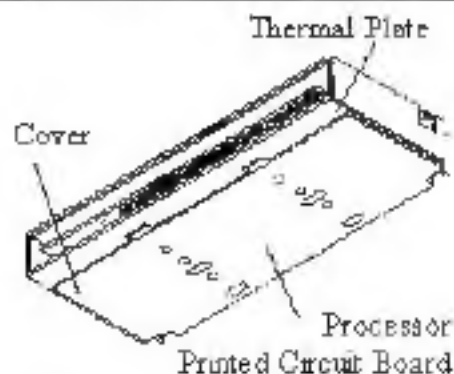


Figure 1. Pentium® II or Deschutes Processor CPU with S.E.C. Cartridge

Processor desktop processors

Accelerated Graphics Port (AGP or A.G.P.)

Typically, 3D graphics rendering requires a tremendous amount of memory, and demands ever increasing throughput speed as well. As 3D products for the personal computer become more and more popular, these demands will only increase. This will cause a rise in costs for both end users and manufacturers. Lowering these costs as well as improving performance is the primary motivation behind AGP. By providing a massive increase in the bandwidth available between the video card and the processor, it will assist in relieving some of these pressures for quite sometime.

Hardware Monitoring

Hardware monitoring allows you to monitor various aspects of your systems operations and status. These features include CPU temperature, voltage and RPM of fan,

P2-112A Form-Factor

The P2-112A is designed with ATX form factor - the latest industry standard of chassis. The ATX form factor is essentially a Baby-AT baseboard rotated 90 degrees within the chassis enclosure and a new mounting configuration for the power supply. With these changes the processor is relocated away from the expansion slots, allowing them all to hold full length add-in cards. ATX defines a double height aperture to the rear of the chassis which can be used to host a wide range of onboard I/O. Only the size and position of this aperture is defined, allowing PC manufacturers to add new I/O features (e.g., TV input, TV output, joystick, modem, LAN, audio, etc.) to systems. This will help systems integrators differentiate their products in the marketplace, and better meet your needs.

- By integrating more I/O down onto the board and better positioning the hard drive and floppy connectors material cost of cables and add-in cards is reduced.
- By reducing the number of cables and components in the system, manufacturing time and inventory holding costs are reduced and reliability will increase.
- By using an optimized power supply, it's possible to reduce cooling costs and lower acoustical noise. An ATX power supply, which has a side-mounted fan, allows direct cooling of the processor and add-in cards making a secondary fan or active heatsink unnecessary in most system applications.

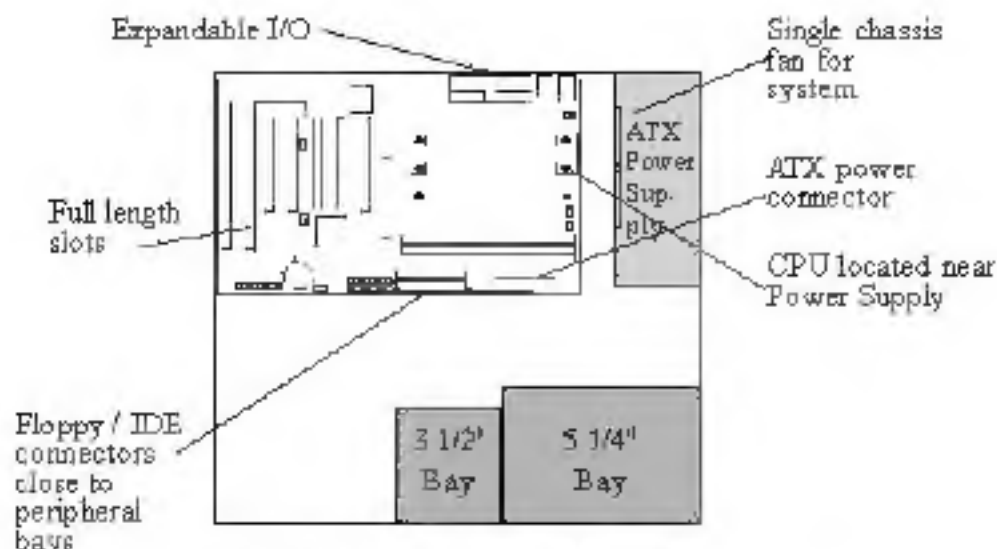


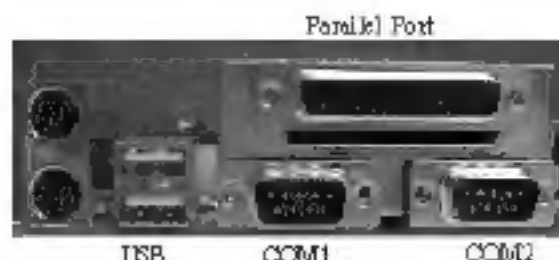
Figure 2+ Summary of ATX chassis features

I/O Shield Connector

The P2-112A is equipped with an I/O back panel. Please use the appropriate I/O shield (Figure 3).

Figure 3:
P2-112A
I/O back
panel layout

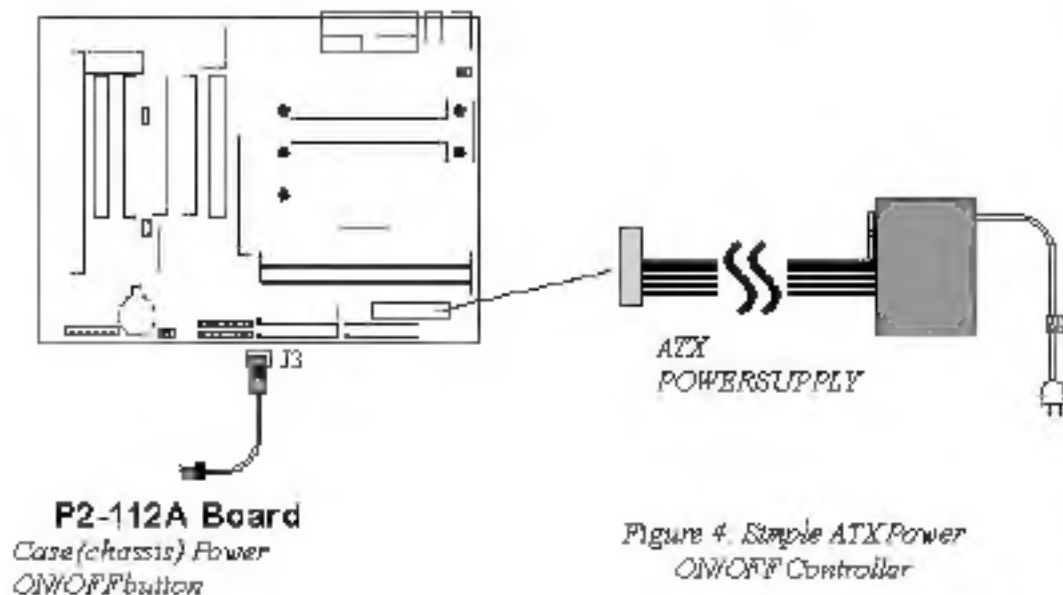
PS/2 Mouse
PS/2 Keyboard



Power-On/Off (Remote)

The P2-112A has a single 20-pin connector for ATX power supplies. For ATX power supplies that support the **Remote On/Off** feature, this should be connected to the systems front panel for system Power On/Off button. The systems power On/Off button should be a momentary button that is normally open.

The P2-112A has been designed with "Soft Off" functions. You can turn Off the system from one of two sources. The first is the front panel Power On/Off button, and the other is the "Soft Off" function (coming from the P2-112A's onboard circuit controller) that can be controlled by the operating system. Windows 95 will control this when the user clicks that they are ready to Shutdown the system.



System Block Diagram

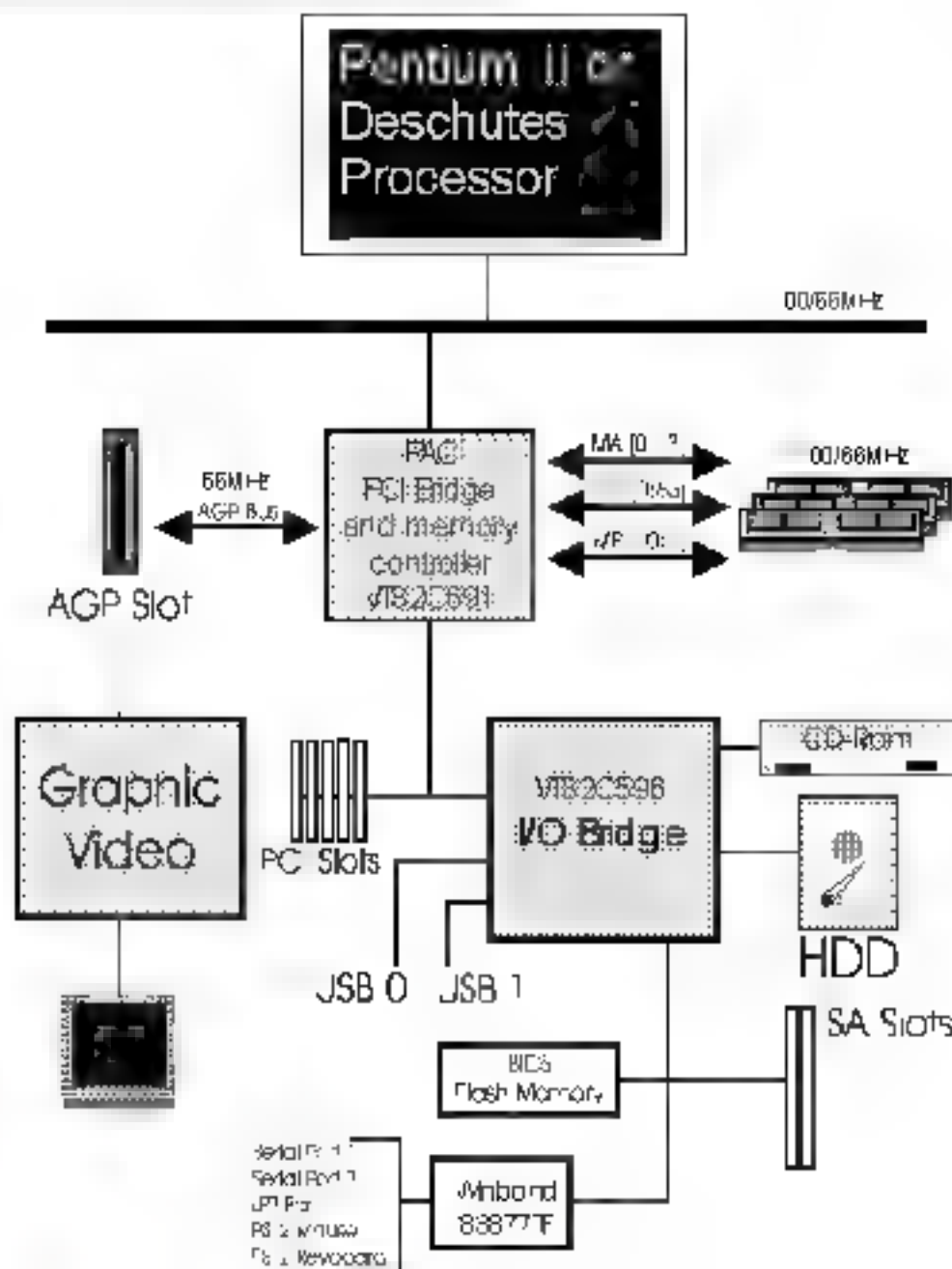


Figure 5. System Block Diagram

Section 2

FEATURES

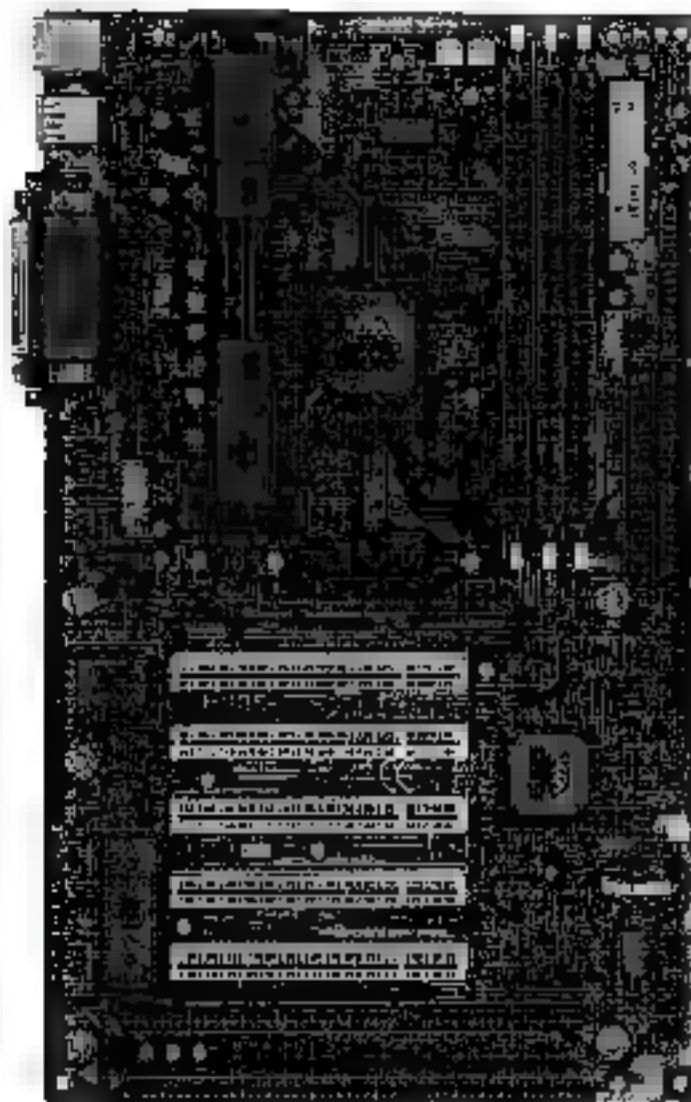
P2-112A Features:

- P2-112A is based on the Pentium® II or Deschutes Processor operating at 233, 333MHz, 66MHz, or 300, 550MHz, 100MHz on Slot 1. The board is configured by ESDJ to match your CPU clock speed.
- Designed with VIA APOLLO PRO AGPset.
- Supports up to 384 Mega of DRAM, minimum of 16 MB on board. You can use 168 pin DIMMs. It will automatically detect Extended Data Output (EDO) DRAM at 66MHz only or Synchronous DRAM memory (SDRAM) at 66MHz or 100MHz (please see Section 3.2).
- P2-112A will support Error Checking and Correcting (ECC) when using parity DRAM memory modules. This will detect multiple bit errors and correct 1-bit memory errors.
- Supports (2) 16 bit ISA slots, (5) 32 bit PCI slots, 1 AGP slot and provides (2) independent high performance PCI IDE interfaces capable of supporting PIO Mode 3/4 and Ultra DMA 33 devices. The P2-112A supports (2) PCI Bus Master slots and a jumperless PCI INT# control scheme which reduces configuration confusion when plugging in PCI cards.
- Supports ATAPI (e.g. CD-ROM) devices on both Primary and Secondary IDE interfaces.
- Designed with Winbond W83877F Main I/O, (1) floppy port, 1 parallel port (EPP/ECP), and (2) serial ports (16550 Fast UART). Note: Japanese "Floppy 3 mode" is also supported.
- Includes a PS/2 mouse connector.
- Allows use of a PS/2 keyboard.
- Features Award Plug & Play BIOS. With Flash Memory you can always upgrade to the current BIOS as they are released. (<http://www.epox.com> please visit our Technical Support section for the latest updates).

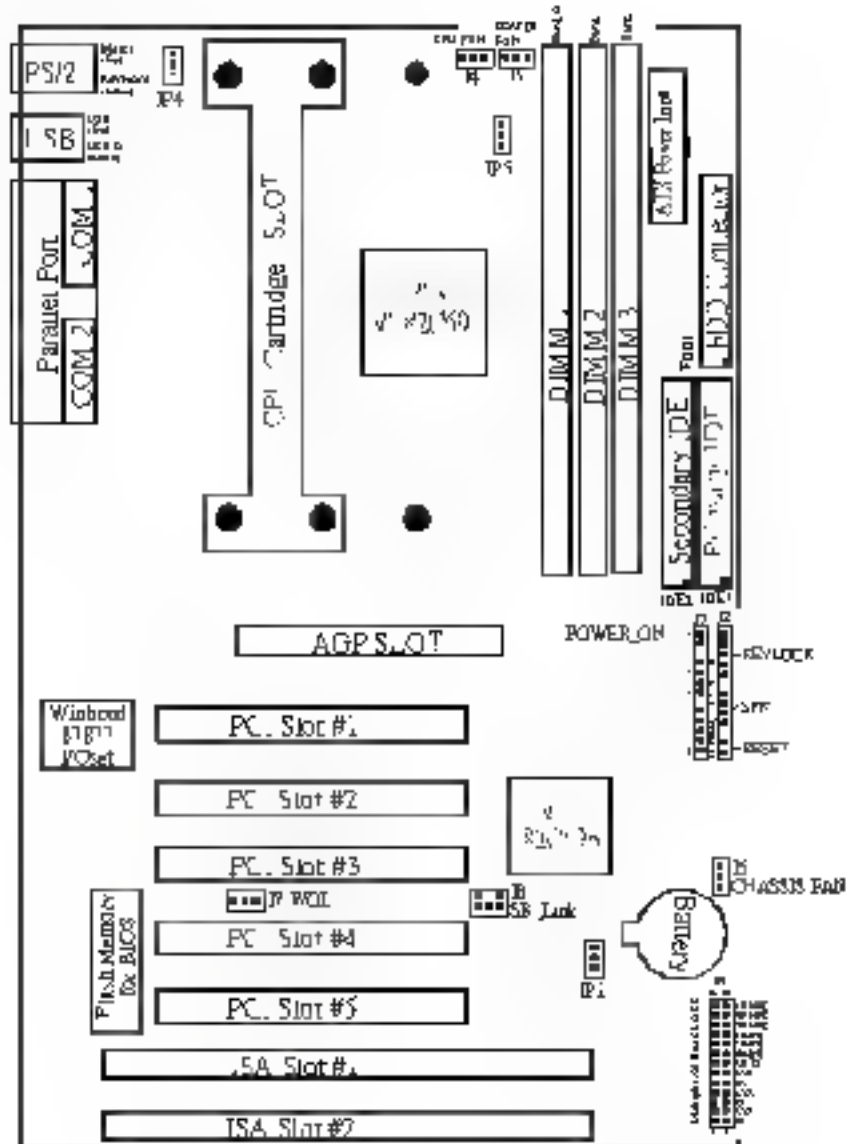
- P2-112A shares a Lithium battery which provides environmental protection and longer battery life
- Supports the Universal Serial Bus (USB) connector. The onboard VT82C596 chip provides the means for connecting PC peripherals such as keyboards, joysticks, telephones, and modems
- Built-in ATX 20-pin power supply connector
- Software power down when using Windows® 95/98
- Supports ring in feature: remote power on through external modem, allows system to be turned on remotely
- Resume by Alarm: Allows your system to turn on at a preselected time
- Supports CPU Hardware sleep and SMM (System Management Mode)
- Supports Keyboard power ON function (KBPO)
- Supports USDM software to offer motherboard various status
- Supports the CPU, PWR and Chassis fan Auto stop in sleep mode
- Built-in WOL (Wake On Lan) Connector
- Built-in SB LINK Header for Creative Blaster® AWE64D PCI Bus Sound Card

Section 3

INSTALLATION



P2-112A Detailed Layout



Figure

Easy Installation Procedure

Easy Installation Procedure

The following must be completed before powering on your new system:

- 3.1. Configure Jumpers to match your hardware
- 3.2. Install memory chips
- 3.3. Install Pentium II Processor
- 3.4. Device Connectors

Section 3-1

Configure DIP Switch

P2 112A designs this motherboard with an ESDJ to make your installation fast and easier.

The following will describe all of the ESDJ that you are required to set before moving on to step 3.2.

Note: The ESDJ as depicted as shown (Figure 1), in their correct physical orientation.

Mother X Bus 1 X 2

P2 112A		
Pin 1	Pin 2	Pin 3
1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24

1. Clear CMOS
2. Run Mode (default)
3. Clear CMOS

4. Keyboard Power on Selection
5. Disabled (default)
6. Enabled

Section 3-2 System Memory Configuration

Memory Layout

The P2 112A supports (3) 168-pin DIMMs (Dual In-line Memory Module). The DIMMs can be either EDO (Enhanced Data Out) or SDRAM (Synchronized DRAM).

- DIMM SDRAM may be 83MHz (12ns), 100MHz (10ns) or 120MHz (8ns) bus speed.
- When using Synchronous DRAM we recommend using the 4 clock variety over the 2 clock.

Figure 2 and Table 1 show several possible memory configurations using both SDRAM and EDO memory.



JP5



SDRAM CLOCK Selection

1 2 SDRAM=CPU (Default)

1 2 3 SDRAM=AGP (2 3 CPU CLOCK)

Total Memory	DIMM 1 (Bank 0)	DIMM 2 (Bank 1)	DIMM 3 (Bank 2)
= 28MB Maximum	EDO SDRAM* 8MB, 16MB, 32MB 64MB, 28MB X	None	None
= 336MB Maximum	EDO SDRAM* 8MB, 16MB, 32MB 64MB, 28MB X	EDO SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB X	None
= 984MB Maximum	EDO SDRAM* 8MB, 16MB, 32MB 64MB, 28MB X	EDO SDRAM* 8MB, 16MB, 32MB, 64MB, 28MB X	EDO SDRAM* 8MB, 16MB, 32MB, 64MB, 28MB X

* SDRAM only supports 8, 16, 32, 64, 128MB DIMM modules.

Table 1

DIMM Module Installation

Figure 5 displays the notch marks and what they should look like on your DIMM memory module.

DIMMs have 168 pins and two notches that will match with the onboard DIMM socket. DIMM modules are installed by placing the chip firmly into the socket at a 90 degree angle and pressing straight down (figure 6) until it fits tightly into the DIMM socket (figure 7).



Figure 5



Figure 6

DIMM Module clip before installation

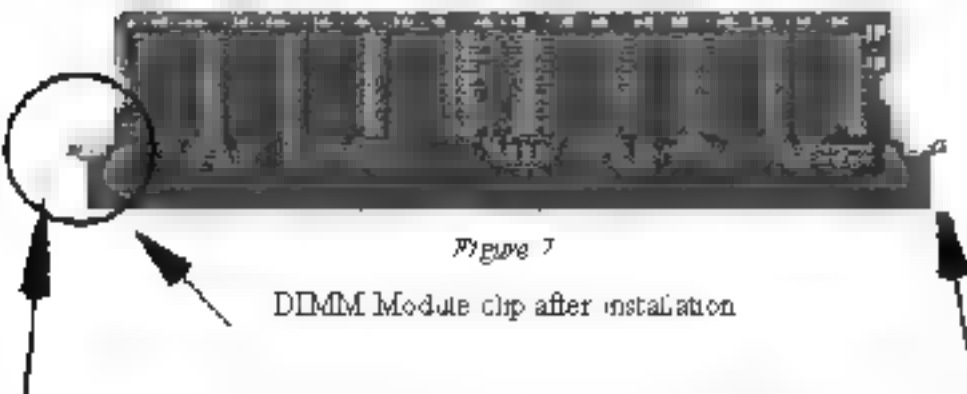


Figure 7

DIMM Module clip after installation

To remove the DIMM module simply press down both of the white clips on both sides and the module will be released from the socket

Section 3-3

Installing a Pentium II Processor

The P2-112A uses the Single Edge Contact (SEC) slot for a Pentium II processor packaged in an SEC cartridge. The SEC slot is not compatible with other non-Pentium II processors.

Please have ready the following list of components so that we may install the processor onto the motherboard.

- 1 Heat sink support (top/bottom piece)
- 2 Pentium II processor heat sink
- 3 Intel Pentium II Processor

OK, now that you have all of your components ready, we can start.

- First, please refer to figure 8 below and follow the direction to lift up the fixed foldable pentium® II Retention Mechanism. This pre-installed device is designed for you to install Pentium® II CPU more easier and to avoid any damage on the board due to overtightening the four screws.
- One thing must be kept in your mind that please make sure to lift upright the foldable parts of the Retention module to fit and install CPU properly.



Figure 8

Now we are going to install the heatsink support base piece (figure 9) onto the motherboard. There is both a large and small hole (figure 10) so that the base will only fit in one direction. This piece needs to be pushed into the holes firmly until it is seated.

Now we are ready to install the SEC Cartridge (Pentium II Processor) into the Retention Module. The SEC Cartridge is mounted by sliding the SEC Cartridge into the Retention Module and letting it slide all the way down. Once it reaches the

bottom make sure you press firmly on SEC cartridge to firmly secure into the Slot 1 Socket

Now we need to secure the heatsink with the top half of the support (figure 11). Take the top piece of the support and slide it into the bottom fin (figure 11) on the heatsink and then push forward until it clips into the bottom base (figure 9) that is already there (figure 11)



Figure 9

Figure 9 shows the layout of Slot 1 and the holes for mounting the Heatsink base piece (figure 8)

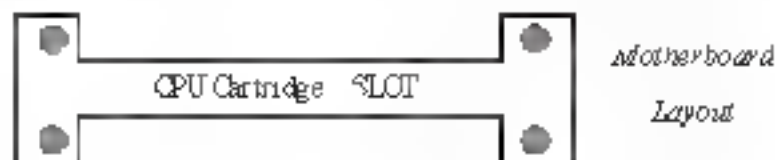


Figure 10

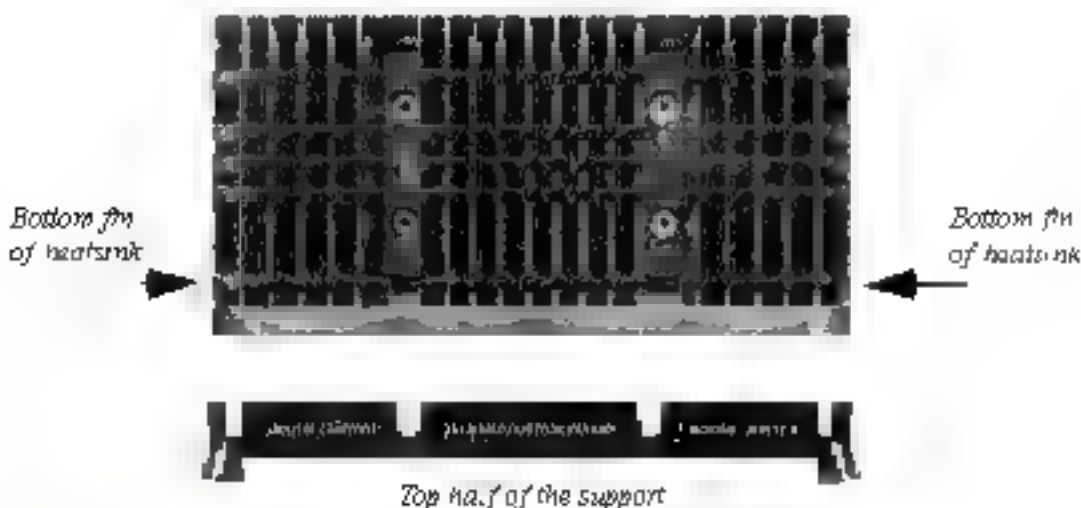


Figure 11

Section 3-4 Device Connectors

Please install the motherboard into the chassis

Now that your motherboard is installed you are ready to connect all your connections (Figure 2)

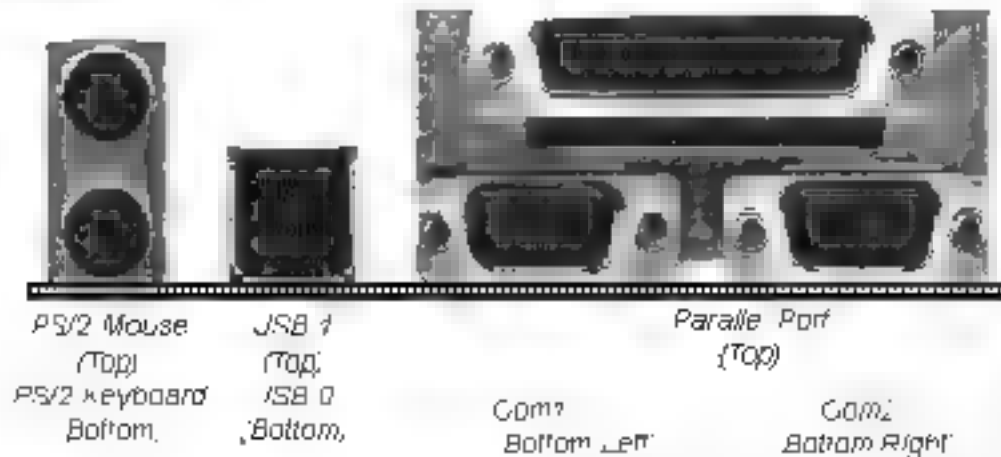


Figure 2

- J1** Keylock, Speaker, Reset
- J3** IR Conn. TB LED HDD LED. POWER_ON
- J4** CPU Fan Power
 - A plug-in for the CPU Fan Power
- J5** POWER Supply FAN POWER
 - A plug-in for Power Supply Fan
- J6** Chassis Fan Power
 - A Plug-in for the chassis Fan Power
- J7** WOL (Wake on Lan, Connector
- J8** SB Link Header
- IDE1** Primary IDE
- IDE2** Secondary IDE
- FDD1** Floppy Controller

Section 3-4**Device Connectors (continued)**

J2	1	■	KeyLock Keyboard lock switch & Power LED connector	
		■	1 Power LED(+) 4 Keylock	
		■	2 N/C 5 GND	
		■	3 GND	
		■		
	1	■	Speaker Connect to the system's speaker for beeping	
		■	1 Speaker 3 GND	
		■	2 N/C 4 GND	
		■		
		■	Reset Closed to restart system	
		■		
J3	1	■	IR Connector	
		■	1 VCC 4 GND	
		■	2 NC 5 IRTX	
		■	3 IRRX	
		■		
	+	■	IDE LED indicator LED ON when Onboard PCT IDE Hard disks is activate	
		■	Turbo LED indicator LED ON when higher speed is selected	
		■		
		■	Power On/Off This is connected to the power button on the case	
		■	Using the Soft-Off by Pwr Button feature, you can choose either	
		■	Instant Off (turns system off immediately) or 4 sec delay (you need to	
		■	hold the button down for 4 seconds before the system turns off) When	
		■	the system is in 4 sec delay mode P2-112A has added a special feature	
		■	to make the system go into suspend mode when the button is pressed	
		■	momentarily	

Section 4

AWARD BIOS SETUP

BIOS Instructions

Award's ROM BIOS provides a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail, this will cause data loss in the CMOS only. If this does happen you will need to reconfigure your BIOS settings.

To enter the Setup Program ,

Power on the computer and press the key immediately, this will bring you into the BIOS CMOS SETUP UTILITY.

ROM PCI SA B OS (2A6LFPA).
CMOS SETUP UTILITY
AWARD SOFTWARE, INC

STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PC CONFIGURATION INTEGRATED PERIPHERALS LOAD SETUP DEFAULTS	SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING
ESC QUIT F10 Save & Exit Setup	<div> <div>↑ ↓ → ←</div> <div>SELECT ITEM</div> </div> <div> <div>Shift/F2</div> <div>Change Color</div> </div>
Time Date, Hard Disk Type	

Figure 4 CMOS Setup Utility

The menu displays all the major selection items. Select the item you need to reconfigure. The selection is made by moving the cursor (press any direction key) to the item and pressing the Enter key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better understanding of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.

4-1 Standard CMOS Setup

Choose "Standard CMOS Setup" in the CMOS SETUP UTILITY Menu (Figure 2). The Standard CMOS Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted, use direction keys to move the cursor and the <Enter> key to select. The entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.

ROM BIOS A BIOSQ2A6LFPA
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm/dd/yy) Wed, Apr 7 1996									
Time (hh:mm:ss) 4:20:10									
HARD DISKS	TYPE	SIZE	CYLs	HEAD	PRECOMP	LANDZONE	SECTORS	MODE	
Primary Master	Auto	0	0	0	0	0	0	Auto	
Primary Slave	Auto	0	0	0	0	0	0	Auto	
Secondary Master	Auto	0	0	0	0	0	0	Auto	
Secondary Slave	Auto	0	0	0	0	0	0	Auto	
<div style="display: flex; justify-content: space-between;"> <div> Drive A: 144M 3.20 Drive B: None Floppy 3 Mode Support: Disabled Video: VGA/VGA Hard On: All But Keyboard </div> <div> Base Memory: 640K Extended Memory: 640.0K Other Memory: 384K <hr/> Total Memory: 1328K </div> </div>									
<div style="display: flex; justify-content: space-between;"> <div> ESC: Quit F1: Help </div> <div> ↑ ↓ → ←: Select Item Shift+F1: Change Color </div> <div> F10: Save & Exit F11: Load Defaults F12: Load & Exit </div> </div>									

Figure 2 Standard CMOS Setup

NOTE If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, then the hard disk size and model will be auto-detected.

Enabled. Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector

Disabled. No warning message will appear when anything attempts to access the boot sector

Note. Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

CPU Internal Cache This controls the status of the processor's internal cache area

The default is Enabled

Enabled: This activates the processor's internal cache thereby increasing performance

Disabled: This deactivates the processor's internal cache thereby lowering performance

CPU L2 Cache ECC Checking. This controls the CPU's L2 cache to support Error Checking and Correcting (ECC),

The default is Disabled

Enabled: Enabled the CPU's L2 cache to Support ECC function. When enabled this item the performance should be impact 2% - 4%

Disabled: Disabled the CPU's L2 cache to support ECC function

External (L2) Cache This controls the status of the external (L2) cache area
The default is Enabled

Enabled: This activates the motherboard's L2 cache thereby increasing performance

Disabled: This deactivates the motherboard's L2 cache thereby lowering performance

Quick Power On Self Test This category speeds up the Power On Self Test (POST)

The default is Enabled

Enabled: This setting will shorten or skip of the items checked during POST

Disabled: Normal POST

Boot Sequence This category determines which drive is searched first by the O/S Operating System.
The default is A,C,SCSI.

The following is your list of options.

[A, C, SCSI] [C, A, SCSI] [C, CD-ROM, A] [CD-ROM, C, A]
[D, A, CD-ROM] [E, A, CD-ROM] [F, A, CD-ROM] [SCSI, A, C]
[SCSI, C, A] [C Only]

Swap Floppy Drive This will swap your physical drive letters A & B if you are using two floppy disks.
The default is Disabled.

***Enabled.** Floppy A & B will be swapped under the O/S*

***Disabled.** Floppy A & B will be not swapped.*

Boot Up Floppy Seek During Power On Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2MB and 1.44MB are all 80 tracks.
The default is Enabled.

***Enabled.** The BIOS will search the floppy disk drive to determine if it is 40 or 80 tracks.*

***Disabled.** The BIOS will not search for the type of floppy disk drive by track number.*

***NOTE:** BIOS can not tell the difference between 720K, 1.2MB and 1.44MB drive types as they are all 80 tracks.*

Boot Up NumLock Status This controls the state of the NumLock key when the system boots.
The default is On.

***On.** The keypad acts as a 10-key pad.*

***Off.** The keypad acts like the cursor keys.*

Gate A20 Option This refers to the way the system addresses memory above 1MB (extended memory).
The default is Fast.

***Normal.** The A20 signal is controlled by the keyboard controller or chipset.*

hardware.

Fast The A20 signal is controlled by Port 92 or chipset specific method.

Typematic Rate Setting: This determines the keystrokes repeat rate.

The default is Disabled.

Enabled: Allows typematic rate and typematic delay programming.

Disabled: The typematic rate and typematic delay will be controlled by the keyboard controller in your system.

Typematic Rate (Chars/Sec) This is the number of characters that will be repeated by a keyboard press.

The default is 6.

6. 6 characters per second. 8. 8 characters per second.
10. 10 characters per second. 12. 12 characters per second.
15. 15 characters per second. 20. 20 characters per second.
24. 24 characters per second. 30. 30 characters per second.

Typematic Delay (msec) This setting controls the time between the first and the second character displayed by typematic auto-repeat.

The default is 250.

250. 250 msec
500. 500 msec
750. 750 msec
1000. 1000 msec

Security Option This category allows you to limit access to the System and Setup or just to Setup.

The default is Setup.

System: The system will not boot, and the access to Setup will be denied if the correct password is not entered at the prompt.

Setup: The system will boot, but the access to Setup will be denied if the incorrect password is not entered at the prompt.

PCI/VGA Palette Snoop This field controls the ability of a primary PCI VGA controller to share a common palette (When a snoop write cycles with an ISA video card).

The default is Disabled.

Enabled: If an ISA card is connected to a PCI VGA card via the VESA connector, and that ISA card connects to a VGA monitor, then that ISA card

uses the RAMDAC of the PCI card.

Disabled: *Disables the VGA card Passive Snoop function.*

OS Select For DRAM > 64MB Some operating systems require special handling. Use this option only if your system has greater than 64MB of memory. The default is Non-OS2.

OS2 Select this if you are running the OS2 operating system with greater than 64MB of RAM.

Non-OS2 Select this for all other operating systems and configurations.

Report No FDD For WIN95 This option allows BIOS to indicate whether WIN95 is with FDD or not. The Default value is NO.

NO Report No FDD for WIN95.

YES Report FDD for WIN95.

Video BIOS Shadow This option allows video BIOS to be copied into RAM. Video Shadowing will increase the video performance of your system. The default is Enabled.

Enabled Video shadow is enabled.

Disabled Video shadow is disabled.

C8000 CBEFF Shadow

CC000 CFFFF Shadow

D0000 D3FFF Shadow

D4000 D7FFF Shadow

D8000 DBFFF Shadow

DC000 DFFFF Shadow

These categories determine whether ROMs from option cards will be copied into RAM. This will be in 16K byte or 32K byte units, and the size will depend on chipset of the option card.

Enabled Optional shadow is enabled.

Disabled Optional shadow is disabled.

4-3 Chipset Features Setup

Choose the "CHIPSET FEATURES SETUP" in the CMOS SETUP UTILITY menu to display following menu.

ROM PC/MISA BIOS(2A59IPAB) CHIPSET FEATURES SETUP AWARD SOFTWARE INC			
Bank 0/1 DRAM Timing	Fast	System/CPU Warning Temp	50°C/120°C
Bank 2/3 DRAM Timing	Fast	Current CPU Temp	39°C/100°C
Bank 4/5 DRAM Timing	Fast	Current System Temp	29°C/84°C
SDRAM Cycle length	Auto	Current CPU Fan Speed	4272 RPM
SDRAM Bank Interleave	Disabled	Current CPU Fan Speed	0 RPM
DRAM Page Mode	Enabled	Current Chassis Fan Speed	0 RPM
Memory Hole At 5Mb Addr	Disabled	CPUIDone	2.76 u CPUID/D 1.41 V
Read Around write	Disabled	+3.3V	5.28 V +5V 4.99 V
Concurrent PCI/Host	Enabled	+12V	2.09 u 2V 1.58 V
Video RAM Cacheable	Disabled	5V	5.07 V
AOP Aperture Size	64M		
CPU Hardware TQ Size	4-Level		
Auto Detect DIMM/PCI Clk	Enabled		
Speed Step/Max Modus/Mod	Disabled		
CPU Host Clock	Default		
Press <Esc> Key while Power-On if system can not boot normally		Es Quit	↑ ↓ → ← Select Item
		F1 Help	PU/PD/+/+ Modify
		F3 Old Value	Shift F3 Color
		F7 Load Setup Defaults	

Figure 4 Chipset Features Setup

SDRAM Cycle length. This setting defines the CAS timing parameter of the SDRAM in terms of clocks.

The default is Auto.

- 2 Provides faster memory performance.
- 3 Provides better memory compatibility.

Video RAM Cacheable. This option allows the CPU to cache read/writes of the video RAM.

The default is Enabled.

- Enabled.** This option allows for faster video access.
- Disabled.** Reduced video performance.

Memory Hole at 15M-16M You can reserve this memory area for the use of ISA adaptor ROMs

The default is Disabled

***Enabled:** This field enables the main memory 15~16MB, to remap to ISA BUS.*

***Disabled:** Normal Setting.*

***NOTE:** If this feature is enabled you will not be able to cache this memory segment*

AGP Aperture Size The amount of system memory that the AGP card is allowed to share

The default is 64

4. 4MB of systems memory accessible by the AGP card.

8. 8MB of systems memory accessible by the AGP card.

16. 16MB of systems memory accessible by the AGP card.

32. 32MB of systems memory accessible by the AGP card.

64. 64MB of systems memory accessible by the AGP card.

128. 128MB of systems memory accessible by the AGP card.

256. 256MB of systems memory accessible by the AGP card.

Spread Spectrum Modulated: Allows you to active the Spread Spectrum Modulation function for reduce EMI (Note: When Enabled the item that performance will be impacted)

The default is Disabled

***Enabled:** Provides the Spread Spectrum function from clock generator*

***Disabled:** NO Spread Spectrum function.*

Current CPU Temperature This is the current temperature of the CPU

Current Power FAN Speed The current power fan speed in RPMs

Current CPU FAN Speed The current CPU fan speed in RPMs

Current Chassis FAN Speed The current chassis fan speed in RPMs

CPU(V) The voltage level of the CPU

+1.5V The voltage level of the CPU's GTL + Bus

+3.3V, +5V, +12V The voltage level of the switch power supply

4-4 Power Management Setup

Choose the "POWER MANAGEMENT SETUP" in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it's absolutely necessary.

ROM PCI ISA BIOS (2A9IPAB)
POWER MANAGEMENT SETUP
AWARD SOFTWARE INC.

Power Management	User Define	Primary Interrupt	ON
PM Control by APM	Yes	IRQ3 (COM2)	Primary
Video off Option	Suspend = Off	IRQ4 (COM1)	Primary
Video off Method	VB SYNC+Blank	IRQ5 (LPT2)	Primary
MODEM Use IRQ	3	IRQ6 (Floppy Disk)	Disabled
Soft-off by PWRBTN	Delay 4 Sec	IRQ7 (LPT1)	Primary
** RMT Timers **		IRQ8 (RTC Alarm)	Disabled
HDD Power Down	Disable	IRQ9 (IRQ2 Reroute)	Primary
Doze Mode	Disable	IRQ0 (Reserved)	Primary
Suspend Mode	Disable	IRQ1 (Reserved)	Primary
** RMT Events **		IRQ2 (PS/2 Mouse)	Primary
UGA	OFF	IRQ3 (Coprocessor)	Primary
LPT & COM	LPT & COM	IRQ4 (Hard Disk)	Primary
HDD & FDD	OFF	IRQ5 (Reserved)	Disabled
DMA Transfer	OFF		
Modem Ring Resume	Disabled	Esc: Quit	↑ ↓ → ← Select Item
MODEM Use IRQ	Enabled	F1: Help	PG, PD, H+, Modify
RTC Alarm Resume	Disabled	F5: Old Values	(Shift)F2: Color
		F7: Load Setup Defaults	

Figure 1. Power Management Setup

You can only change the content of Doze Mode, Standby Mode, and Suspend Mode when the Power Management is set to "User Define".

Power Management Use this to select your Power Management selection. The default is User define.

Disabled The system operates in NORMAL conditions (Non-GREEN) and the Power Management function is disabled.

Max. saving Max. min. power savings. Inactivity period is 15 minute in each mode.

Min. saving Minimum power savings. Inactivity period is 1 hour in each mode.

User define Allows user to define PM Timers parameters to control power saving mode.

PM controlled APM This option shows whether or not you want the Power Management to be controlled the Advanced Power Management (APM)

The default is Yes

Yes. APM controls your PM

No. APM does not control your PM

Video Off Method This option allows you to select how the video will be disabled by the power management

The default is V/H Sync + Blank

V/H Sync + Blank. System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer

DPMS. Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.

Blank Screen System only writes blanks to the video buffer

Video Off option Tells you what time frame that the video will be disabled under current power management settings

The default is Standby

Standby. Video powers off after time shown in standby mode setting.

Dose. Video powers off after time shown in dose mode setting

Suspend. Video powers off after time shown in suspend mode setting

N/A. Video power off not controlled by power management.

MODEM Use IRQ Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Default is IRQ 3

<i>N/A.</i> No IRQ is used.	<i>3.</i> IRQ 3
<i>4.</i> IRQ 4	<i>5.</i> IRQ 5
<i>7.</i> IRQ 7	<i>9.</i> IRQ 9
<i>10.</i> IRQ 10	<i>11.</i> IRQ 11

The P2-112A supports HDD Power Down, Dose and Standby power saving functions when using the Intel® Pentium® II Processor

The default is Disabled

Doze Mode: The "Doze" mode timer starts to count when no "PM events" have occurred.

Suspend Mode: This function works only when the Pentium II Processor is installed. The timer starts to count when "System Standby" mode timer is timed out and no "PM Events" are occurring. Valid range is from 1 minute up to 1 hour.

HDD Power Down: HDD Standby timer can be set from 1 to 15 minutes.

VGA Active Monitor: Use this option if your monitor has advanced power saving features.

The default is Enabled.

***Enabled:** Your monitor's power features will be included in power management.*

***Disabled:** Your monitor's power features will not be included in power management.*

Soft-Off by PWR BTTN: Use this to select your soft-off function.

The default is Delay 4 sec.

***Instant Off:** Turns off instantly.*

***Delay 4 Second:** Turns off after a 4 second delay. If momentary press of button, the system will go into Suspend Mode. Press again to take system out of Suspend Mode.*

Resume by Alarm: This option allows you to have the system turn on at a preset time each day or on a certain day. This option is only available when Power Loss Recovery is Enabled.

The default is Enabled.

***Enabled:** The system will turn on at the preset time.*

***Disabled:** The system will not turn on until you turn it on.*

Date of month Alarm: This is how you set the date that the system will turn on. The default is 0.

***0:** Setting this to 0 will turn the system on everyday at the preset time.*

***1-31:** Represents the day of the month that you need the system to turn on.*

Time (hh:mm:ss) Alarm: This sets the time that you need the system to turn on. The default is 08:00:00.

4-5 PNP/PCI Configuration

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

WARNING: *Conflicting IRQ's may cause the system to not find certain devices*

ROM PCI/ISA BIOS(2A6LFPAA)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC

PNP OS Installed	No	CPU to PCI Write Buffer	Enabled
Resources Controlled By	Manual	PCI Dynamic Bursting	Enabled
Reset Configuration Data	Disabled	PCI Master/0 WS Write	Enabled
		PCI Bus Transaction	Enabled
IRQ-3 assigned to	Legacy ISA	PCI Master Read Prefetch	Enabled
IRQ-4 assigned to	Legacy ISA	PCI Access #0: Entry	Disabled
IRQ-5 assigned to	PCI/ISA PnP	AGP Master WS Write	Enabled
IRQ-7 assigned to	Legacy ISA	AGP Master WS Read	Disabled
IRQ-9 assigned to	PCI/ISA PnP		
IRQ-10 assigned to	PCI/ISA PnP	PCI IRQ Asserted By	Local
IRQ-11 assigned to	PCI/ISA PnP	Assign IRQ For USB	Enabled
IRQ-12 assigned to	PCI/ISA PnP	Assign IRQ For VOA	Enabled
IRQ-14 assigned to	Legacy ISA		
IRQ-15 assigned to	Legacy ISA		
DMA-0 assigned to	PCI/ISA PnP		
DMA-1 assigned to	PCI/ISA PnP		
DMA-3 assigned to	PCI/ISA PnP		
DMA-5 assigned to	PCI/ISA PnP		
DMA-6 assigned to	PCI/ISA PnP		
DMA-7 assigned to	PCI/ISA PnP		

Figure 6 PCI Configuration Setup

PNP OS Installed: Do you have a PNP OS installed on your system. The default is No.

Yes. Select if you are using a PNP OS

No. Select if your OS does not support PNP

Resources Controlled By: Who controlled the system PNP/PCI resources. The default is Manual.

Manual: PNP Card's resources will be controlled manually. You can see which IRQ X and DMA X are assigned to PCI/ISA PNP or Legacy ISA Cards.

Auto: If your ISA card and PCI card are all PNP cards BIOS will assign the interrupt resource automatically.

Reset Configuration Data This setting allows you to clear ESCD data. The default is Disabled.

Disabled: Normal Setting.

Enabled: If you have plugged in some Legacy cards to the system and they were recorded into ESCD (Extended System Configuration Data), you can set this field to Enabled in order to clear ESCD.

PCI IDE IRQ Map To This item allows the user to configure the system for the type of IDE hard disk controller in use. By default, the BIOS assumes that the hard drive controller is an ISA device rather than a PCI controller. If you are using a PCI controller, then you will need to change this to specify which PCI slot has the controller and which PCI interrupt (A, B, C, or D) is associated with the connected IDE devices.

Assign IRQ For USB This item allows BIOS to assign whether IRQ is with USB or not. If you have not connected the USB device, you can release the IRQ for other device.

The default is Enabled.

Enabled: Provides IRQ for USB device.

Disabled: Releases IRQ for other device.

4-6 Load Setup Defaults

The "LOAD SETUP DEFAULTS" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.

4-7 Integrated Peripherals

ROM PCMSA BIOSQ2A6LEPPAA
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC

OnChip IDE Channel0	Enabled	Onboard Parallel Port	Auto
OnChip IDE Channel1	Enabled	Onboard Parallel Mode	ECP EPP
IDE Prefetch Mode	Enabled	PIO Mode Use DMA	Auto
IDE HDD Block Mode	Enabled	Parallel Port EPP Type	EPP P15
Primary Master PIO	Auto	OnChip USB	Enabled
Primary Slave PIO	Auto	USB Keyboard Support	Disabled
Secondary Master PIO	Auto		
Secondary Slave PIO	Auto		
Primary Master UDMA	Auto		
Primary Slave UDMA	Auto		
Secondary Master UDMA	Auto		
Secondary Slave UDMA	Auto		
Init Display First	PCI Slot		
Onboard FDD Controller	Enabled		
Onboard Serial Port 1	3F8/IRQ4	Exit	Quit
Onboard Serial Port 2	2F8/IRQ3	F1	Help
UART 2 Mode	Standard	F5	Old values
		F7	Load Setup Defaults
			PU/PD (+/-) Modify
			(Shift, F1) Color

Figure 8 Integrated Peripherals

Note If you do not use the Onboard IDE connector then you will need to set Onboard Primary PCI IDE. Disabled and Onboard Secondary PCI IDE Disabled

Note The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm.)

IDE HDD Block Mode IDE Block Mode allows the controller to access blocks of sectors rather than a single sector at a time

The default is Enabled

Enabled Enabled IDE HDD Block Mode Provides higher HDD transfer rates.

Disabled Disables IDE HDD Block Mode.

Onchip IDE First Channel The default value is Enabled

Enabled Enables Onboard IDE primary port.

Disabled Disables Onboard IDE primary port.

Onchip IDE Second Channel

The default is Enabled.

Enabled. Enables Onboard IDE secondary port.

Disabled. Disables Onboard IDE secondary port.

Primary Master PIO

The default is Auto.

Auto. BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode

Mode 0-4 Manually set the IDE Programmed interrupt mode

Primary Slave PIO

The default is Auto.

Auto. BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode

Mode 0-4 Manually set the IDE Programmed interrupt mode

Secondary Master PIO

The default is Auto.

Auto. BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode

Mode 0-4 Manually set the IDE Programmed interrupt mode

Secondary Slave PIO

The default is Auto.

Auto. BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode

Mode 0-4 Manually set the IDE Programmed interrupt mode

Primary Master UDMA This allows you to select the mode of operation for the hard drive

The default is Auto.

Auto. The computer will select the optimal setting.

Disabled. The hard drive will run in normal mode.

Primary Slave UDMA This allows you to select the mode of operation for the hard drive

The default is Auto.

Auto The computer will select the optimal setting.
Disabled The hard drive will run in normal mode.

Secondary Master UDMA This allows you to select the mode of operation for the hard drive.

The default is Auto.

Auto The computer will select the optimal setting.
Disabled The hard drive will run in normal mode.

Secondary Slave UDMA This allows you to select the mode of operation for the hard drive.

The default is Auto.

Auto The computer will select the optimal setting.
Disabled The hard drive will run in normal mode.

USB Keyboard Support This controls the activation status of an optional USB keyboard that may be attached.

The default is disabled.

Enabled Enable USB keyboard support.
Disabled Disable USB keyboard support.

Onboard FDD Controller This controls the state of the onboard floppy controller. The default value is Enabled.

Enabled Enable the Onboard Winbond Chips's floppy drive interface controller.
Disabled Disable the Onboard Winbond Chip's floppy drive interface controller.

Onboard Serial Port 1 This field allows the user to configure the 1st serial port. The default is Auto.

AUTO Enable Onboard Serial port 1 and address is Auto adjusted.
COM1 Enable Onboard Serial port 1 and address is 3F8H/IRQ4.
COM2 Enable Onboard Serial port 1 and address is 2F8H/IRQ3.
COM3 Enable Onboard Serial port 1 and address is 3E8H/IRQ4.
COM4 Enable Onboard Serial port 1 and address is 2E8H/IRQ3.
Disabled Disable Onboard SMC CHIP's Serial port 1.

Onboard Serial Port 2 This field allows the user to configure the 2nd serial port.
The default is Auto.

AUTO Enable Onboard Serial port 2 and address is Auto assigned
COM1 Enable Onboard Serial port 2 and address is 3F8H IRQ4
COM2 Enable Onboard Serial port 2 and address is 2F8H IRQ3
COM3 Enable Onboard Serial port 2 and address is 3E8H IRQ4
COM4 Enable Onboard Serial port 2 and address is 2E8H IRQ4
Disabled Disable Onboard SMC Chip's Serial port 2.

UART Mode Select The mode of the IR Controller.
The default is Normal.

IrDA Support a Serial Infrared Interface IrDA.

ASKIR Support a Sharp Serial Infrared Interface format.

Normal The IRRX and IRTX pins of IR function in normal condition.

Onboard Parallel port This field allows the user to configure the LPT port.
The default is 378H IRQ7.

378H Enable Onboard LPT port and address is 378H and IRQ7
278H Enable Onboard LPT port and address is 278H and IRQ5
3BCH Enable Onboard LPT port and address is 3BCH and IRQ7
Disabled Disable Onboard Winbond Chip's LPT port.

Parallel Port Mode This field allows the user to select the parallel port mode.
The default is ECP+EPP.

Normal Standard mode. IBM PC/AT Compatible bidirectional parallel port.
EPP Enhanced Parallel Port mode.
ECP Extended Capabilities Port mode.
EPP+ECP ECP Mode & EPP Mode.

ECP Mode USE DMA This field allows the user to select DMA 0 or DMA3 for the ECP mode.
The default is DMA0.

DMA0 This field selects the routing of DMA0 for the ECP mode.
DMA3 This field selects the routing of DMA3 for the ECP mode.

Power On Method: There are "Button Only" "Hot Key" and "Any key" can be chosen by this field that allows users to select one of these various functions as Power On Method for their requirement.

The default value in this selection is "Hot Key" (Ctrl-F1).

Hot Key: User can press "Control Key" (Ctrl) and "Function Key" from F1 to F12 individually to power on the system.

The interval between "Ctrl" key and function Key (F1-F12), must be short.

Anykey: Press anykey to power on the system.

Button Only: This power on method is controlled by J1 (power-on) Use Power On Button to power on the system.

Password: User can Power On the System by password, the password can be entered from 1 to 5 characters. The maximum of password is 5 characters.

If user forget/loss the password, please go into B.O.S setting to change the Power On Method, or key in another words as password instead of original one.

4-8 Change Supervisor or User Password

To change the password, choose the "SUPERVISOR PASSWORD or USER PASSWORD" option from the CMOS SETUP UTILITY menu and press [Enter].

NOTE: Either "Setup" or "System" must be selected in the "Security Option" of the BIOS FEATURES SETUP menu.

1. If CMOS is corrupted or the option was not used, a default password stored in the ROM will be used. The screen will display the following message:

Enter Password:

Press the [Enter] key to continue after the proper password is given.

2. If the CMOS is corrupted or the option was used earlier and the user wishes to change the default password, the SETUP UTILITY will display a message and ask for a confirmation.

Confirm Password:

3. After pressing the [Enter] key (ROM password if the option was not used or current password user defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

4.4 IDE HDD Auto Detection

The "IDE HDD auto detection" ability is a very useful tool, especially when you do not know which kind of hard disk type you are using. You can use this ability to detect the correct disk type installed in the system automatically. But now you can set HARD DISK TYPE to Auto in the STANDARD CMOS SETUP. You don't need the "IDE HDD AUTO DETECTION" ability. The BIOS will Auto-detect the hard disk size and mode on display during POST.

ROM POSTING BIOS(JAGLFPAA)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISK	TYPE	SIZE	CYL	HEADS	PERC	LAND	SECTORS	MODE
Primary Master								
Select Secondary Slave Option (0=Skip) N								
OPTIONS	SIZE	CYL	HEAD	PERC	LAND	SECTORS	MODE	
0/0	43.0	728	2.5	0	4887	63	LBA	
1	43.0	1488	0	65535	4887	63	NORMAL	
3	43.0	928	144	65535	4887	63	LARGE	
Note: Some OSes like SCO UNIX must use NORMAL for installation								
[Esc] Skip								

Figure 8 IDE HDD Auto Detection

NOTE HDD Modes

The Award BIOS supports 3 HDD modes: NORMAL, LBA & LARGE NORMAL mode.

Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, head & sectors for NORMAL mode are

1024 16 & 63	
no Cylinder	1024)
x no Head	16
x no Sector	63)
<u>x no. per sector</u>	<u>512</u>
	528 Megabytes

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (Logical Block Addressing) mode A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD. The maximum HDD size supported by LBA mode is 8.4 GigaBytes which is obtained by the following formula:

no Cylinder	(1024)
x no Head	255)
x no Sector	63)
<u>x bytes per sector</u>	<u>512</u>
	8.4 GigaBytes

LARGE mode Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support. In some cases, user do not want LBA. The Award BIOS provides another alternative to support these kinds of LARGE mode.

<u>CYL</u>	<u>HEADS</u>	<u>SECTOR</u>	<u>MODE</u>
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS or other OS that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside.

1024 16 & 63	
no Cylinder	1024)
x no Head	16
x no Sector	63)
<u>x no. per sector</u>	<u>512</u>
	528 Megabytes

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (Logical Block Addressing) mode A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD. The maximum HDD size supported by LBA mode is 8.4 GigaBytes which is obtained by the following formula:

no Cylinder	(1024)
x no Head	255)
x no Sector	63)
<u>x bytes per sector</u>	<u>512</u>
	8.4 GigaBytes

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1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS or other OS that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside.

Appendix A:

A-1 MEMORY MAP

Address Range	Size	Description
00000-7FFFF]	5.2K	Conventional memory
80000-9FBFF]	27K	Extended Conventional memory
9FC00-9FFFF]	K	Extended BIOS data area if PS/2 mouse is installed
A0000-C7FFF]	60K	Available for HiDOS memory
C8000-DFFFF]	96K	Available for HiDOS memory and adapter ROMs
E0000-EFFFF]	60K	Available for UMB
EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adapter
FD000-F7FFF]	32K	BIOS CMOS setup utility
FB000-FCFFF]	20K	BIOS runtime service routine (2)
FD000-FDFFF]	4K	Plug and Play ESCD data area
FE000-FFFFFF]	8K	BIOS runtime service routine (1)

A-2 I/O MAP

000-01F]	DMA controller 'Master
020-021]	INTERRUPT CONTROLLER (Master)
022-023]	CHIPSET control registers I/O ports
040-05F]	TIMER contro. registers
060-06F]	KEYBOARD interface controller '8042'
070-07F]	RTC ports & CMOS I/O ports
080-09F]	DMA register
0A0-0BF]	INTERRUPT controller 'Slave
0C0-0DF]	DMA controller 'Slave
0FD-0FF]	MAIHC PROCESSOR
1FD-1F8]	HARD DISK controller
278-27F]	PARALLEL port 2
2BD-2DF]	GRAPHICS adapter controller
2FB-2FF]	SERIAL port 2
360-36F]	NETWORK ports
378-37F]	PARALLEL port
3BD-3BF]	MONOCROME & PARALLEL port adapter
3C0-3CF]	EGA adapter

[3D0-3DF]	CGA adapter
[3F0-3F7]	FLOPPYDISK controller
[3F8-3FF]	SERIAL port

A-3 TIMER & DMA CHANNELS MAP

TIMER MAP

TIMER Channel 0	System timer interrupt
TIMER Channel 1	DRAMREFRESH request
TIMER Channel 2	SPEAKER tone generator

DMA CHANNELS

DMA Channel 0	Available
DMA Channel 1	Onboard ECP (Option)
DMA Channel 2	FLOPPYDISK (SMC CHIP)
DMA Channel 3	Onboard ECP (default)
DMA Channel 4	Cascade for DMA controller
DMA Channel 5	Available
DMA Channel 6	Available
DMA Channel 7	Available

A-4 INTERRUPT MAP

NMI

Parity check error

IRQ (H/W)

0	System TIMER interrupt from TIMER 0
1	KEYBOARD output buffer full
2	Cascade for IRQ 8-15
3	SERIAL port 2
4	SERIAL port
5	PARALLEL port 2
6	FLOPPYDISK (SMC CHIP)
7	PARALLEL port 1
8	RTC clock
9	Available
10	Available
11	Available
12	PS/2 Mouse
13	MATH coprocessor

- 14 Onboard HARD DISK IDE1 channel
- 15 Onboard HARD DISK IDE1 channel

A-5 RTC & CMOS RAM MAP

RTC & CMOS

- 00 Seconds
- 01 Second alarm
- 02 Minutes
- 03 Minutes alarm
- 04 Hours
- 05 Hours alarm
- 06 Day of week
- 07 Day of month
- 08 Month
- 09 Year
- 0A Status register A
- 0B Status register B
- 0C Status register C
- 0D Status register D
- 0E Diagnostic status byte
- 0F Shutdown byte
- 1 FLOPPY DISK drive type byte
- 2 Reserve
- 3 HARD DISK type byte
- 4 Reserve
- 5 Equipment type
- 6 Base memory low byte
- 7 Base memory high byte
- 8 Extension memory low byte
- 9 Extension memory high byte
- 9-20
- 2E-2F
- 30 Reserved for extension memory low byte
- 31 Reserved for extension memory high byte
- 32 DATE CENTURY byte
- 33 INFORMATION FLAG
- 34-3F Reserve
- 40-7F Reserved for CHIPSET SETTING DATA

Appendix B:

B-1 POST CODES

ISA POST codes are typically output to I/O port address 80h.

POST (hex)	DESCRIPTION
01-02	Reserved
C0	Turn off OEM specific cache shadow
03	1 Initialize EISA registers (EISA BIOS only) 2 Initialize all the standard devices with default values Standard devices includes DMA controller (8237) Programmable Interrupt Controller (8259) Programmable Interval Timer (8254) RTC chip
04	Reserved
05	1 Keyboard Controller Self Test
06	2 Enable Keyboard interface
07	Reserved
08	Verifies CMOS's basic R/W functionality
C	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	OEM specific cache initialization (if needed)
0A	1 Initialize the first 32 interrupt vectors with corresponding interrupt handlers Initialize NT numbers from 33- 20 with Dummy Spurious Interrupt Handler 2 Issue CPU ID instruction to identify CPU type 3 Early Power Management initialization (OEM specific)
0B	1 Verify the RTC time is valid or not 2 Detect bad battery 3 Read CMOS data into BIOS stack area 4 PnP initializations including: PnP BIOS only + Assign CSN to PnP ISA card Create resource map from ESCD 5 Assign I/O & Memory for PCI devices (PCI BIOS only)

0C	Initialization of the BIOS Data Area (40:00 - 40:FF)
0D	<ol style="list-style-type: none">1. Program some of the Chipset's value according to Setup. (Early Setup Value Program)2. Measure CPU speed for display & decide the system clock speed.3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep
0E	<ol style="list-style-type: none">1. Test video RAM. (If Monochrome display device found)2. Show messages including.<ul style="list-style-type: none">- Award Logo, Copyright string, BIOS Data code & Part No.- OEM specific sign on messages- Energy Star Logo. (Green BIOS ONLY)- CPU brand, type & speed.- Test system BIOS checksum. (Non-Compress Version only)
0F	DMA channel 0 test.
10	DMA channel 1 test.
11	DMA page registers test.
12-13	Reserved.
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1.
16	Test 8259 interrupt mask bits for channel 2
17	Reserved.
19	Test 8259 functionality
1A-1D	Reserved.
1E	If EISA NVM checksum is good, execute EISA initialization (EISA BIOS only)
1F-29	Reserved.
30	Detect Base Memory & Extended Memory Size.
31	<ol style="list-style-type: none">1. Test Base Memory from 256K to 640K.2. Test Extended Memory from 1M to the top of memory.
32	<ol style="list-style-type: none">1. Display the Award Plug & Play BIOS Extension message. (PnP BIOS only)2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port etc. according to setup value.
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility.
3D	<ol style="list-style-type: none">1. Initialize Keyboard.2. Install PS2 mouse

3E	Try to turn on Level 2 cache. Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 6th.
3F-40	Reserved.
4F	1. Program the rest of the Chipset's value according to Setup (Later Setup Value Program)
41	2. If auto-configuration is enabled, program the chipset with pre-defined Values.
42	Initialize floppy disk drive controller.
43	Initialize Hard drive controller.
45	If it is a PnP BIOS, initialize serial & parallel ports.
44	Reserved.
45	Initialize math coprocessor.
46-4D	Reserved.
4E	If there is any error detected (such as video, kb,...), show all error messages on the screen & wait for user to press <F1> key.
4F	1. If password is needed, ask for password. 2. Clear the Energy Star Logo. (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS.
51	Reserved.
52	1. Initialize all ISA ROMs. 2. Later PCI initializations. (PCI BIOS only) - assign IRQ to PCI devices. - initialize all PCI ROMs. 3. PnP Initializations. (PnP BIOS only) - assign IO, Memory, IRQ & DMA to PnP ISA devices. - initialize all PnP ISA ROMs. 4. Program shadows RAM according to Setup settings. 5. Program parity according to Setup setting. 6. Power Management Initialization. - Enable/Disable global PM. - APM interface initialization.
53	1. If it is NOT a PnP BIOS, initialize serial & parallel ports. 2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.
60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting.

61	<ol style="list-style-type: none">1. Try to turn on Level 2 cache. <p>Note: If L2 cache is already turned on in POST 3D, this part will be skipped</p> <ol style="list-style-type: none">2. Set the boot up speed according to Setup setting.3. Last chance for Chipset initialization.4. Last chance for Power Management initialization. (Green BIOS only)5. Show the system configuration table.
62	<ol style="list-style-type: none">1. Setup daylight saving according to Setup value.2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting.
63	<ol style="list-style-type: none">1. If there is any changes in the hardware configuration, update the ESCD information. (PnP BIOS only)2. Clear memory that have been used3. Boot system via INT 19H.
FF	System Booting. This means that the BIOS already pass the control right to the operating system.

B-2 Unexpected Errors:

POST (hex)	DESCRIPTION
B0	If interrupt occurs in protected mode
B1	Unclaimed NMI occurs, 0

The **"LOAD SETUP DEFAULTS"** function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary when you accept this motherboard, or the system CMOS data is corrupted.

STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOCS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	HDD LOW LEVEL FORMAT
PNP/PCI CONFIGURATION	BTUP
INTEGRATED PERIPHERALS	SAVING
LOAD SETUP DEFAULTS	

Load SETUP Default (Y/N)? Y

ESC: QUIT

F10: Save & Exit Setup

↑ ↓ → SELECT ITEM

(Shift)F2 :Change Color

Load Setup Defaults Except Standard CMOS SETUP